

Do-It-Yourself Lung: Part 1



1

Insert a drinking straw into the mouth of a standard party balloon. Make sure the balloon fits securely—but not too tightly—over the straw.



2

Drill a hole in the bottom of a large, clear plastic drinking cup. The hole should be just large enough for the straw to fit through.

In one hand, hold the cup upside down. Holding the straw at the balloon end, push the other end of the straw up through the hole in the bottom of the cup. (The balloon should now be inside the cup.)



3

Use some putty to seal any gaps between the straw and the hole in the bottom of the cup. Stretch some thin rubber material across the mouth of the cup. Make sure it's airtight. Voila! A lung.



4



5

Hold the cup with the straw end up. Use your thumb to push up on the thin diaphragm over the mouth of the glass. What happens? The balloon deflates. You have exhaled. Remove your thumb and let the rubber sheet spring back. What happens? The balloon inflates. You have inhaled.

Pushing and releasing the rubber diaphragm changes the air pressure inside the cup, causing the balloon to inflate and deflate. Pressing the cup's diaphragm up produces the same effect as when an animal diaphragm contracts. Pressure in the chamber goes up, and the air in the balloon (lung) is forced out. When the diaphragm is released, pressure in the chamber decreases, and air flows in to equalise the pressure.

The diaphragm may be thin, but it's quite powerful. You know this if you've ever had the hiccups. A hiccup is breathing in, unintentionally. The diaphragm contracts involuntarily—rather like a muscle spasm. This pulls air into the lungs very quickly. The opening between the vocal cords closes unexpectedly, and the vocal cords come together so quickly they vibrate, causing the familiar 'hic' sound.